AF/2674

PATENT APPLICATION
Mo-5152/LeA 33,069

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICATION OF)
) GROUP NO.: 2674
WOLFGANG JACOBSEN ET AL)
)
SERIAL NO.: 09/291,832)
)
FILED: APRIL 14, 1999)
)
TITLE: DISPLAY COMPRISING TOUCH PANEL)

LETTER

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed herewith are three copies of an Appeal Brief in the matter of the subject Appeal. Please charge the fee for filing the Brief, $330.00, to our Deposit Account Number 50-2527.

Respectfully submitted,

By _____
Diderico van Eyl
Attorney for Appellants
Reg. No. 38,641

Bayer Chemical Corporation
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3069
FACSIMILE PHONE NUMBER:
(412) 777-2016

F:\SHARED\JD\DVE\DE0009.doc

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents Alexandria, VA 22313-1450, on October 2, 2003
Date
Diderico van Eyl Reg. No. 38,641
Name of Appellant, assignee or Registered Representative
Signature
October 2, 2003
Date

MO-5152

24/Appeal Brief 11-2-03 NP

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APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

This Brief, submitted in triplicate, is an appeal from the Final Office Action dated October 2, 2002, in which Claims 26-50 were finally rejected. A Notice of Appeal was filed on April 2, 2003. A separate Petition of Time is being filed simultaneously herewtih.

I. REAL PARTY IN INTEREST

The real party in interest is assignee Bayer AG.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences which directly or indirectly affect the present appeal.

III. STATUS OF CLAIMS

Claims 26-50 stand rejected.

IV. STATUS OF AMENDMENTS

Claims 26-50 stand as amended in an Amendment filed on April 2, 2003.

V. SUMMARY OF THE INVENTION

Appellants' invention relates to a display device comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source arranged on at least one end face of the transparent cover plate. The display device has a touch sensor. Appellants' invention also relates to a method that involves touch recognizing Appellants' display device so that radiation from the radiation source periodically varies with time at the frequency, and the electric signal from the photodetector is further processed so that predominantly only that part of the signal which likewise varies periodically with time and approximately varies at the same frequency as the radiation power from the radiation source is evaluated. Appellants' invention can be used in applications in which touch screens are used. As discussed on page 1, third full paragraph, touch screens are predominantly used as input devices and display pictures, e.g., explicatory texts.

VI. ISSUES

The issues before the Board are as follows:

1. Are Claims 26-50 non-obvious novel under 35 USC 103?

VII. GROUPING OF CLAIMS

Claims 26-50 stand together as a single group.

VIII. ARGUMENTS

The Examiner rejected Claims 26-50 under 35 USC 103 over U.S. Pat. No. 3,832,034 (Edmonds) in view of U.S. Pat. No. 5,117,071 (Greanias). The rejection should be withdrawn in view of the remarks below.

To establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir, 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496, (CCPA 1970). The Examiner did not establish a *prima facie* case of obviousness.

The Examiner alleged that the a touch sensor is only in the preamble and that "[a]lthough the claims are interpreted in light of the specification, limitations from the specification are not read into the claims." The preamble is part of the claims and the language in the preamble should be construed as a limitation. MPEP 2111.02, for instance, expressly states that "a claim preamble has the import that the claim as a whole suggests for it." The MPEP expressly states that "[i]f the claim preamble, when read in light of the context of the entire claim, recites limitations of the claim, or, if the claim preamble is necessary to give life, meaning, and vitality to the claim, then the preamble should be construed as if in the balance of the claim."
As such, it was wrong for the Examiner to ignore the preamble. Regardless, Appellants amended expressly place the touch sensor in the body of the claim. With that said, Appellants respond to the Examiner.

Edmonds does not teach a display device with a touch sensor. Edmonds teaches a liquid crystal cell in which one pair of opposed space electrodes is circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes (See Abstract). Edmonds was based on the discovery that a liquid crystal display can be operated in a two-color fashion by circumscribing the back or reflecting the electrode with a dielectric color shield having a hue, chroma and brightness substantially matching either the color of the back electrode or of the reflected color induced by the scattering of the liquid crystal material (See. Col. 1, ll. 58-64). Edmonds teaches that one particularly desirable shield for such purpose is an anodized film of aluminum which can be suitably dyed by conventional means for color matching (See Col. 1, ll. 64-68).

One of ordinary skill in the art following Edmonds would not have been motivated to modify Edmonds and make or practice Appellants' invention. Edmonds does not teach a display device with a touch sensor. The Edmonds liquid crystal is structurally and functionally different from Appellants' invention and in no way teaches a structure even remotely similar to a display device with a touch sensor comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source arranged on at least one end face of the transparent cover plate. Further, Edmonds does not teach the other embodiments encompassed by Appellants' invention. Reconsideration is requested.

The Examiner did not recognize that Edmonds does not provide the necessary technical information that would have taught one of ordinary skill in the art how to convert the touching of the display surface into an electrical signal and make or practice Appellants' invention. Edmonds teaching, for instance, that its liquid crystal cell has one pair of opposed space electrodes circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the

color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes would not have motivated one of ordinary skill in the art to modify Edmonds and make a display device with a touch sensor comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photo-sensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source arranged on at least one end face of the transparent cover plate.

Similarly, Edmonds' discovery that a liquid crystal display can be operated in a two-color fashion would have been similarly lacking in any meaningful guidelines. One of ordinary skill in the art dealing with touch sensors would not have considered this document. Edmonds teaching that one particularly desirable shield is an anodized film of aluminum which can be suitably dyed by conventional means for color matching would not have provided the requisite information to enable one of ordinary skill in the art to modify Edmonds and make or practice Appellants' invention. Reconsideration is requested.

Greanias fails to overcome the deficiencies of Edmonds. In fact, Greanias simply lacks any teaching that would have made one of ordinary skill in the art modify Edmonds and make or practice Appellants' invention. Appellants' submit that one of ordinary skill in the art would not have been motivated to combine Edmonds and Greanias as alleged by the Examiner.

Greanias teaches a liquid crystal display on which two layers of conductors are arranged vertically to each other and in isolation from each other (Figs. 1, 2 and 3). These conductors are made of ITO and are connected to an external bus. The so-called "stylus" (cf. Fig. 4) evidently merely contains an electrical contact between the "antenna" 50 and the cable 22. The "light pen" referred to by the Examiner is thus in no way associated with light. The conductors are evidently supplied with an oscillating voltage (40 kHz, cf. Fig. 13a). Depending on how the crossed conductors are switched, the position of the "stylus" can be determined via the electrical signal ("capacitance measurement", Claim 1).

The device described by Greanias does not use light (as according to Appellants' invention) but variations in capacitive electrical resistances. In Appellants' invention, Appellants' use, *inter alia*, a conventionally designed liquid crystal cell. Light is injected into the cover plate. A light detector is located beneath the support plate. This detector normally does not receive any light, since this remains in the cover plate due to total reflection. On touching the cover plate with one finger the light is coupled out and scattered back by the finger. It then passes through both plates vertically to the cell and impinges on the detector which then produces a signal. The position of the finger on the cover plate can be determined when a large number of detectors having a very narrow angle of incidence for the light to be detected are located beneath the support plate. The problem to be solved - namely the indication of the position of, for example, a finger - thus takes place electrically in the Greanias patent and optically in Appellants' invention.

Greanias teaches a touch overlay that was intended to provide (i) an interactive stylus input device for freehand drawing, handwriting, and gestures, that can also be used to select items by finger as well as stylus, (ii) very precise contact detection when using the stylus, (iii) a stylus and touch sensor display system, and (iv) accurately determine stylus location independent of the angle at which the stylus is held (See Column 3, lines 51-63). The Greanias touch overlay has a array of horizontal and vertical conductors, a control microprocessor, a stylus antenna, a radiative signal measuring means to measure stylus input, a capacitive measurement means to measure finger input, a radiative source to drive the conductors and a switchable path to connect the conductors to the radiative source, the radiative signal measuring means and the capacitive measuring means in response to control commands by the control microprocessor.

Greanis does not bridge the gaps that separate Edmonds from Appellants' invention. The Examiner alleged that it would have been obvious to utilize a radiation source and an optical detector as taught by Greanis in the liquid crystal display disclosed by Edmonds because this would provide a stylus and touch sensor display system which is reliable and inexpensive to manufacture. Such reasoning does not in any way show how the combined teachings of Edmonds and Greanis

would have motivated one of ordinary skill in the art following Edmonds to modify Edmonds and make or practice Appellants' invention.

Greanis is fundamentally different from Edmonds. At Columns 5 and 6, Greanis refers to Fig. 1 and describes a touch workpad housing 12 having a rectangular recessed window 14 which surrounds the edges of a rectangular touch overlay 16. The overlay 16 is transparent and is disposed on a liquid crystal display (LCD) 18. Greanis teaches the overlay 16 consists of a laminate structure including several plastic substrate layers laminated together by means of adhesive layers also including a first plurality of transparent conductors 16A disposed in the horizontal direction and a second plurality of transparent conductors 16B disposed in the vertical direction. According to Greanis, several of the conductors in both vertical and horizontal directions are positioned beyond the recessed window 14 to allow more accurate location determination of the stylus 20 or a finger on the LCD 18 at the edges of the display window 14. A stylus 20 is connected by cable 22 to the touch workpad. Greanis explains that the stylus 20 acts as an antenna to pick up the signals radiated by the overlay 16, and provides much greater resolution than can be provided by a finger touch.

One of ordinary skill in the art would have realized that the Greanias touch overlay would be different from the Edmonds liquid crystal cell--a cell in which one pair of opposed space electrodes is circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes.

Needless to say, the alleged combination would result in a structure that is fundamentally different from Appellants' invention. According to Appellants' invention, Appellants' device is structured so that the touching of the display surface is detected by measuring the light emitted by a radiation source arranged on one end face of the transparent cover system. Greanias teaches a finger touch and stylus detection system which can be used as a device for a data processing system. According to Greanias, its device detects the location of a finger touch on the screen by the change in capacitance of the overlay or alternately the location of a stylus on

the screen is detected by measuring the radiative signal input of the stylus antenna (See Col. 3, l. 65 - Col. 4, l. 9). Reconsideration is requested.

As such, Greanias would not have provided one of ordinary skill in the art following the teachings of Edmonds to modify Edmonds and make or practice Appellants' invention. Appellants request that the USPTO acknowledge the differences that exist between their invention and Edmonds, singly or in combination with Greanis.

In view of the amendments and remarks above, withdrawal of all rejections is requested.

Respectfully submitted,

GERHARD WÖTTING
ERNST GUGEL
HANS ANDREAS LINDNER
PETER WODITSCH

By _____
Diderico van Eyl
Attorney for Appellants
Reg. No. 38,641

Bayer Corporation
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-8355
FACSIMILE PHONE NUMBER:
(412) 777-8363

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APPENDIX: CLAIMS ON APPEAL

1-25. (Previously Cancelled).

26. (Previously Amended) A display device with comprising:

(a) a transparent cover plate,

(b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range,

(c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate,

(d) a radiation source radiation source arranged on at least one end face of the transparent cover plate so that light of the radiation source can enter and illuminate the cover plate, wherein the display device has a touch sensor.

27. (Previously Added) The display device according to Claim 26, wherein the cover plate and the support plate are joined together by a ring seal to form a cell, and an electrochromic medium is located in the cell volume, and the plates are provided with a transparent electrically conductive coating on their sides facing the electrochromic medium.

28. (Previously Added) The display device according to Claim 26, wherein the liquid crystal cell comprises a transparent top plate and a transparent bottom plate that are joined together by a ring seal and between in which the liquid crystals are located, the sides of the plates, which face one another is provided with a transparent electrically conductive coating, and with an orienting layer, and the sides of the plates that are remote from one another is provided with a polarization film.

29. (Previously Added) The display device according to Claim 26, wherein the electrochromic cell or the liquid crystal cell has a coating on the bottom plate that predominantly reflects visible light while it is predominantly transparent to the light emitted by the radiation source.

30. (Previously Added) The display device according to Claim 26, wherein the electrochromic cell or the liquid crystal cell has a coating on the bottom plate that optionally contains a location transparent to the light from the radiation source at the center of the photosensitive solid angle range of the photodetector.

31. (Previously Added) The display device according to Claim 26, wherein the electrochromic cell or the liquid crystal cell has a semi-transmissive and semireflecting coating on the bottom plate.

32. (Previously Added) The display device according to one Claim 28, wherein the electrochromic medium or the liquid crystal medium is two-dimensionally illuminated from the side facing the support plate.

33. (Previously Added) The display device according to Claim 32, wherein (i) the two-dimensional illumination is carried out through an optically transparent grid plate that is arranged between the bottom plate and the support plate, (ii) a light source is arranged on at least one of the end faces of the grid plate and the grid plate having, on the side remote from the support plate, an optically refractive grid like surface structure for positionally metered emergence of light from the interior of the plate, and (iii) a scattering layer serving as an illumination surface is arranged on or over this side.

34. (Previously Added) The display device according to Claim 33, wherein the grid density of the surface structure of the grid plate becomes greater with increasing distance from the light source.

35. (Previously Added) The display device according to Claim 33, wherein the grid plate is identical to the support plate or to the bottom plate of the electrochromic cell or of the liquid crystal cell.

36. (Previously Added) The display device according to Claim 26, wherein the cover plate has a thickness of at least 0.05 mm.

37. (Previously Added) The display device according to Claim 26, wherein the cover plate has a refractive index of at least 1.5.

38. (Previously Added) The display device according to Claim 26, wherein an intermediate layer is located between the top plate of the electrochromic cell or of the liquid crystal cell and the cover plate.

39. (Previously Added) The display device according to Claim 38, wherein the intermediate layer has a refractive index that is less than the refractive index of the cover plate.

40. (Previously Added) The display device according to Claim 38, wherein the intermediate layer comprises air or LTV radiation-polymerizable mixtures of polyfunctional (meth)acrylic acid derivatives, monofunctional (meth)acrylates or suitable photoinitiators, or of solid materials produced using a sol-gel process and having a porosity of more than 50% based on silicates, aluminates and other binary or ternary systems.

41. (Previously Added) The display device according to Claim 26, wherein the bottom plate of the electrochromic cell or of the liquid crystal cell is identical to the support plate and/or the top plate is identical to the cover plate.

42. (Previously Added) The display device according to Claim 26, wherein the radiation source has an emission maximum at a wavelength of more than 680 nm.

43. (Previously Added) The display device according to Claim 26, wherein the end face illuminated by the radiation source is roughened so as to b weakly scattering.

44. (Previously Added) The display device according to one Claim 26, wherein at least one and at most three end faces of the cover plate are coated with an optically reflecting material.

45. (Previously Added) The display device according to Claim 44, wherein the optically reflecting material is gold, silver, copper, nickel or aluminum, and mixtures thereof, and the layers are produced by evaporation coating, sputtering, CVD or adhesive bonding of metal-coated films.

46. (Previously Added) The display device according to Claim 26, wherein a plurality of photodetectors are fitted on the support plate, a specific region of the cover plate, in which a region is uniquely assigned to the photodetector, lying in the photosensitive solid angle range of each photodetector.

47. (Previously Added) The display device according to Claim 26, wherein a unit for processing the electrical signal is connected downstream of each photodetector.

48. (Previously Amended) A method comprising touch recognizing a display device that includes:

(a) a transparent cover plate lying on a photosensitive solid angle range,

(b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range,

(c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate,

(d) a radiation source radiation source arranged on at least one end face of the transparent cover plate so that light of the radiation source can enter and illuminate the cover plate,

wherein radiation from the radiation source periodically varies with time at the frequency, and the electric signal from the photodetector is further processed so that predominantly only that part of the signal which likewise varies periodically with time and approximately varies at the same frequency as the radiation power from the radiation source is evaluated; wherein the display device has a touch sensor.

49. (Previously Added) The method according to Claim 48, wherein the relative width of the frequency band accepted during the further processing in the signal from the photodetector around the frequency is less than 0.1.

50. (Previously Added) The method according to Claim 48, wherein the touch sensor can be switched off fully or for a limited time and, after a predetermined time, switches itself on again or can be switched on again by a specific signal sequence.